



Health Consultation

NUTTING TRUCK & CASTER COMPANY

FARIBAULT, RICE COUNTY, MINNESOTA

CERCLIS NO. MND006154017

JUNE 2, 2000

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

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CERCLIS NO. MND006154017

Prepared By:

Minnesota Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Foreword

This document summarizes public health concerns at a hazardous waste site in Minnesota. It is based on a formal site evaluation prepared by the Minnesota Department of Health (MDH). A number of steps are necessary to do such an evaluation:

- Evaluating exposure: MDH scientists begin a site evaluation by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it is found on the site, and how people might be exposed to it. Usually, MDH does not collect its own environmental sampling data; instead MDH relies on information provided by the Minnesota Pollution Control Agency (MPCA), the U.S. Environmental Protection Agency (EPA), and other government agencies, businesses, and the general public.
- Evaluating health effects: If there is evidence that people are being exposed—or could be exposed—to hazardous substances, MDH scientists will take steps to determine whether that exposure could be harmful to human health. The report focuses on public health i.e., the health impact on the community as a whole and is based on existing scientific information.
- Developing recommendations: In the evaluation report, MDH outlines its conclusions regarding any potential health threat posed by a site and offers recommendations for reducing or eliminating human exposure to contaminants. The role of MDH in dealing with individual sites is primarily advisory. For that reason, the evaluation report will typically recommend actions to be taken by other agencies—including EPA and MPCA. However, if an immediate health threat exists, MDH will issue a public health advisory warning of the danger and will work to resolve the problem.
- Soliciting community input: The evaluation process is interactive. MDH starts by soliciting and evaluating information from various government agencies, the organizations responsible for cleaning up the site, and the community surrounding the site. Any conclusions about the site are shared with these groups and organizations that provided the information. Once an evaluation report has been prepared, MDH seeks feedback from the public. *If you have questions or comments about this report, you are encouraged to contact MDH.*

Please write to:

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I. Summary of Background and History

The former Nutting Truck and Caster Company site (the site) is located in Faribault, Minnesota, a city of approximately 19,177 residents (1998 estimate) located about 50 miles south of the Twin Cities metropolitan area. The Minnesota Department of Health (MDH) prepared a public health assessment (PHA) for the Agency for Toxic Substances and Disease Registry (ATSDR) for the site in June, 1989. A Site Review and Update (SRU) was also prepared in October 1995 to provide an update on site conditions (MDH 1995). This document has been prepared in response to concerns raised by residents of Faribault regarding the Nutting Truck and Caster Company site.

The groundwater beneath the site is contaminated as a result of the disposal of waste solvents and the subsequent leaching of these solvents into the groundwater. The area around the site is a mixture of retail, light manufacturing, and residential zones. A general map of the site location is attached as Figure 1. The site is listed on both the federal National Priorities List (NPL) and the state's Permanent List of Priorities (PLP), the federal and state Superfund lists respectively. The information in this document was obtained from a review of MDH and Minnesota Pollution Control Agency (MPCA) files, discussions with individuals associated with the site, and a site visit.

The site operated continuously from 1891 to 1984. Nutting manufactured and distributed casters, wheels, hand trucks, and towline trucks during that time. An abandoned gravel pit, located on the site, was used for disposal of foundry wastes, sand, gravel, and hazardous wastes such as waste solvents. The northwest corner of the gravel pit was the last area to be filled and has come to be known as the "disposal pit" (Barr 1996). Nutting subsequently moved its operations out of the state. The site of the property is now known as Prairie Avenue Leasing, Ltd.

Geology/Hydrogeology

There are four geologic units/aquifers beneath the site. The uppermost soil layer is composed of intermixed sand and silty sand that was deposited during the last glacial period. Below this is the bedrock of the St. Peter sandstone aquifer, which is composed of a fine to medium grained sandstone. Near the base of the St. Peter sandstone, there is commonly a clayey zone that, when present, can impede but not prevent vertical movement of groundwater. Below the St. Peter are the Prairie du Chien dolomite (limestone) and the Jordan sandstone, which together are the important regional aquifer. There are significant fractures and karst features (cave-like openings) in the Prairie du Chien dolomite. These openings conduct much of the groundwater flow and can be vertically and horizontally extensive.

Groundwater flow in the uppermost unit is to the north or northeast. Groundwater flow in the Prairie du Chien also tends to be to the north; however the presence of fractures and karst features results in the concentration of groundwater flow in narrow openings of unknown location which can result in unpredictable flow rates and directions. A slight upward vertical gradient has been observed between the Prairie du Chien and glacial aquifers at the site.

Environmental Investigations

A study conducted in 1979 concluded that (1) the sludge in the disposal pit contained significant amounts of methylene chloride and trichloroethylene (TCE), which are common industrial solvents; (2) the groundwater below the disposal pit was contaminated with metals and solvents; and (3) the direction of groundwater flow was generally to the north (later studies further define the flow as northeast) (MDH 1995). The disposal pit was excavated in 1980, filled in, and paved over. The location of the former disposal pit can be seen in Figure 2.

Soil

With the excavation of the disposal pit in 1980, all known areas of soil contamination were removed. While there may be some areas of soil contamination associated with the remaining contaminated groundwater, this contamination is well below the surface and not easily accessible.

Groundwater

A total of seven monitoring wells, located both on and off the site, are currently in use to monitor groundwater conditions at the site. The locations of the monitoring wells are shown in Figure 2. The wells have been monitored on a semi-annual basis for most of their history; monitoring is now conducted annually with the approval of the MPCA (MPCA 1998). Samples from the monitoring wells are tested for TCE and several of its breakdown products. TCE has been the primary contaminant detected, and the only chemical found in excess of its MDH Health Risk Limit (HRL) of 30 micrograms per liter ($\mu\text{g/L}$). Levels of TCE breakdown products have only slightly exceeded laboratory detection limits.

Monitoring wells B4, B5, B8, B12 and B15 are screened in the glacial outwash or St. Peter aquifer, while wells W13 and W14 are screened in the Prairie du Chien aquifer. Historical groundwater monitoring data is presented in Table 1. Levels of volatile organic compounds, or VOCs, in monitoring well B4, the closest well downgradient of the former disposal pit, have ranged from a high of 580 $\mu\text{g/L}$ of TCE in 1982, to a low of 20 $\mu\text{g/L}$ in 1993. Levels of TCE have consistently been below 100 $\mu\text{g/L}$ since 1989, with the exception of the most recent sampling event when TCE was detected at a level of 350 $\mu\text{g/L}$. Low levels (well below the HRL) of TCE have also been detected in monitoring well B5, located just upgradient of the disposal pit. Levels of TCE in other downgradient monitoring wells (B8, B12, and B15) have consistently been well below the HRL (B15) or below laboratory detection limits (B8 and B12). This indicates that the TCE plume in the shallowest aquifer is limited in extent.

TCE has consistently been detected in monitoring well W13, indicating that some TCE contamination is present in the Prairie du Chien aquifer below the site. TCE has never been detected in well W14, located downgradient of the site, however.

Response Actions

A Remedial Investigation/Feasibility Study (RI/FS) was conducted by Nutting and their contractor (Barr Engineering) between 1984 and 1986 in order to characterize any remaining contamination. The RI/FS provided the data necessary for the development of a Response Action

Plan (RAP) in 1987. The RAP presented the details for a groundwater pump-out system that would intercept and mitigate the identified contaminant plume as it left the Nutting property. Specifically, the RAP proposed: 1) the pump out of contaminated groundwater until a concentration of 50 $\mu\text{g/L}$ TCE was consistently achieved in the alluvium at the Nutting property boundary; and 2) the monitoring of groundwater to assess the effectiveness of the pump-out system. The system was installed in late 1987 and has been operating with little interruption since.

The system consists of two pumpout wells, PW17 and PW18, located just to the north and downgradient from the site, across Division Street. The wells are completed at different depths, with PW17 set at a depth of approximately 50 feet below ground and PW18 at approximately 25 feet below ground. The wells pumped a total of 34 million gallons of groundwater in 1999 (Barr 2000). Water from the wells is pumped to a catch basin located next to the wells, where it is allowed to cascade down a ladder-like structure. This cascading effect is designed to treat the groundwater by allowing any VOCs in the water to volatilize to the air. The treated water is then discharged via a storm sewer to Crocker's Creek. The treatment system does not remove all of the VOCs from the groundwater, and the discharge is monitored and controlled by a federal permit under the National Pollutant Discharge Elimination System (NPDES permit number MN0057541). The locations of the pumpout wells, catch basin, and outfall are shown in Figure 2. The construction of the treatment system is shown in Figure 3. Levels of TCE observed over time in the pumpout wells are illustrated in Figure 4. Levels of TCE have declined significantly over time, and are currently at approximately 5 $\mu\text{g/L}$ in PW 17 and 10 $\mu\text{g/L}$ in PW 18.

Because response actions are ongoing at the site, a "Five Year Review" was conducted by the MPCA according to EPA guidelines in 1994, and again in 1998 (MPCA 1998). The five year review is intended to ensure that the remedies implemented continue to be protective of public health and the environment. The most recent review document concluded that the levels of TCE in the pumpout wells and most monitoring wells are consistently below the site-specific clean-up standard of 50 $\mu\text{g/L}$, but remain above the maximum contaminant level (MCL) established by the U.S. EPA of 5 $\mu\text{g/L}$. Levels of TCE in one monitoring well (B4) are above the HRL of 30 $\mu\text{g/L}$. The report recommended that the existing remedial system should be tested to ensure that it can meet the site cleanup goal of 50 $\mu\text{g/L}$ on a long-term basis, and to determine if the system is adequate to control contamination in the underlying Prairie du Chien aquifer. It also recommended that additional remedial technologies continue to be explored for potential use. The MPCA also stated that as long as the system continues to operate, it adequately protects human health and the environment.

Site Visit

On February 29, 2000, Jim Kelly and Dan Peña of MDH visited the site. Briefly, the following were observed:

- ▶ The former Nutting Truck and Caster Company site is located on the corner of Division

Street and Prairie Avenue SW. Part of the facility appears to be vacant, and part is occupied by a number of small businesses. The area which was excavated (to remove the disposal pit) is now effectively capped with a paved, fenced, and gated parking lot for the adjacent businesses. Other than the monitoring wells, there was no obvious signs of contamination remaining in the area, such as mounds of soil or debris. The monitoring wells on the Nutting site appear to be in good shape (B4, W13, B5), as do the downgradient monitoring wells located on 2nd Street (B8, B12, W14).

- ▶ The area surrounding the Nutting site is a mixed residential, commercial, and light industrial area. The city high school, as well as a technical college, are located one block southeast of the site.
- ▶ The groundwater pumpout system was operating. The two pumpout wells, PW 17 and PW 18, located across Division Street, were running. Water could be heard running over the "ladder" treatment system located in the catch basin next to the wells. The manhole cover is a grate, so any VOCs volatilized by the treatment system would vent here, or from two storm sewer grates located west along Division Street. No VOC odors were detected.
- ▶ From the catch basin, the water runs through the storm sewer, west along Division Street, and discharges from a large outfall into Crocker's Creek. The volume of water flowing from the culvert was consistent with the reported pumping rate of the wells of about 4-5 liters per second.

Community Concerns

Due to the low profile of the groundwater pumpout system, and the time elapsed since the completion of waste excavation activities, community involvement with the site has traditionally been minimal. Recently, however, MDH was contacted by a group of citizens interested in environmental issues in Faribault, including the Nutting site. They also expressed concerns over the historical contamination in the city's wells, other potential sources of contamination such as area businesses, and a perceived rise in local cancer rates. This document will evaluate the Nutting site and its potential impact on public health; other issues raised by the group will be evaluated in a broader public health assessment (PHA) on the Faribault city wells.

II. Discussion

Trichloroethylene (TCE) was used extensively in the metal fabrication industry as a metal degreasing solvent. It is also used in the manufacture of other chemical products (ATSDR 1997). Exposure to high concentrations of TCE in air can cause headaches, dizziness, or unconsciousness. Dermal contact with concentrated solutions of TCE can produce skin rashes or

other skin problems. Ingestion of TCE at very high doses (e.g. hundreds of times above what is found at the site) may cause nerve damage, liver and kidney damage, and may also be associated with reproductive or development effects. Although animal studies have shown that high doses of TCE can cause tumors in rats and mice, it is uncertain whether people who are exposed to lower doses of TCE have a higher risk of cancer. The cancer classification is currently being reviewed by EPA (TCE formerly was listed as a "probable human" carcinogen). The MDH HRL for drinking water assumes cancer to be the endpoint of concern.

TCE normally degrades in the subsurface environment following predictable pathways (ATSDR 1997). There are many factors which determine the rate at which TCE will degrade, such as the presence or absence of oxygen in the groundwater, the pH of the water, or the concentrations of other substances needed by microorganisms to help break down the TCE. Only low levels of breakdown products of TCE have been observed in water samples collected at the site, well below their respective HRLs or MCLs. This indicates that up until this point TCE is not being significantly degraded in the aquifer. The lack of biological degradation is in and of itself not a cause for concern, as several of the breakdown products of TCE, such as vinyl chloride, are significantly more toxic than TCE itself.

Groundwater

With the exception of the most recent sample from monitoring well B4, contaminants levels in the upper aquifers appear to have decreased since the installation of the groundwater treatment system. Some seasonal fluctuations are apparent, however. Unlike the upper aquifers, the contamination levels in the Prairie du Chien at the site (in monitoring well W13) have remained relatively constant. It has been suggested that the contamination found in the impacted Prairie du Chien monitoring well is leakage from the upper aquifer resulting from the placement of the well. Although this is a possibility, it seems unlikely given that vertical gradients in the site area suggest that flow would be from the Prairie du Chien aquifer *upward* into the more contaminated St. Peter and glacial aquifers. In addition, due to the complex geology, it is nearly impossible to know whether monitoring wells are correctly placed in fractures that lead in a downgradient direction from the source area.

Groundwater in the area of the site generally flows in a north to northeasterly direction. The city of Faribault municipal wells are located about one-half mile downgradient from the site. These wells pump water from the Prairie du Chien/Jordan aquifer. In 1982, the wells were found to contain TCE. The TCE concentrations in some of the individual contaminated municipal wells have at times been above the MCL, the maximum allowable federal limit applied to public or community water supply systems, and above the health-based HRL, the maximum allowable level applicable to private water supplies in Minnesota. The MCLs incorporate technical and economic factors such as available treatment technologies, and the cost of treatment in the development of individual MCLs. While the MCLs are also designed to be protective of human health, these other factors can greatly influence whether the MCL is higher or lower than the corresponding HRL. The TCE concentrations in the public distribution system have generally been maintained below the MCL through losses during treatment and by relying on less contaminated or uncontaminated wells. The overall quality of the city well water appears to have improved since

the Nutting pump-out system began operation in late 1987, as measured during quarterly monitoring events which are shown in Figure 5. However, this relationship may only be circumstantial. Monitoring was conducted annually beginning in 1998 due to the low levels of VOCs detected in 1997.

Soil/Air

Because all of the remaining contamination is below the surface, and the disposal pit area has been covered with a concrete pad, there currently is no human exposure possible to residual contaminants that may remain in soil.

Contaminants released from the groundwater aeration treatment system are well below levels of health concern. To verify that this is the case, a calculation was conducted to determine the maximum amount of VOCs that could have been volatilized during pumping and treatment of the contaminated groundwater. The combined historical maximum TCE values and highest volume pumping rates were used to develop a worst-case emission rate for each pumpout well. These results were then compared to allowable emission standards for treatment systems using a simple spreadsheet developed by the MPCA, as shown in Table 2. The calculations showed that maximum possible emission rates from the treatment system are well below the allowable emission rates. Therefore, no possible health threat was posed by emissions from the groundwater treatment system at any point in its operation.

Given the historical levels of groundwater contamination, the depth at which it is found, and the flow direction, it is highly unlikely that TCE or other VOCs in the groundwater would volatilize or migrate through the soil and pose a potential health risk in nearby structures. The areal extent of the groundwater plume is small, and the overall levels of TCE in groundwater are such that any TCE volatilized from the groundwater would not likely reach levels of health concern in any structures in which it could accumulate. The possibility will further diminish with time.

Surface Water

Surface water bodies in the region are limited to wetland areas, small lakes occupying undrained kettlehole depressions, the Cannon River (located about one mile north of the site), and the Straight River (located about one mile east of the site). Treated water from the pump-out system is discharged via a storm sewer to Crocker's Creek about 3 blocks west of the site, where it then flows northward to the Cannon River. Although the creek is open to the public, concentrations of VOCs are within limits established in the NPDES discharge permit and do not pose a risk to public health.

Agency for Toxic Substance and Disease Registry (ATSDR) Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children make them of special concern to communities faced with contamination of their water, soil, air, or food. Children are at greater risk than adults from certain kinds of exposures to hazardous substances at waste disposal sites. They are more likely to be exposed because they play outdoors and they often bring food into contaminated areas. They are shorter than adults, which means they breathe dust, soil, and heavy vapors close to the ground. Children also weigh less, resulting in

higher doses of chemical exposure per body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

Exposure by children to VOCs in soil or air at the site is not likely. Exposure to VOCs in the city's drinking water supply, which may or may not be related to the site, has occurred. Levels of VOCs may have exceeded the applicable MCLs before testing, and at times exceeded the MCLs since testing began in the early 1980s. It is unlikely, based on accumulated data however, that levels of VOCs in the city of Faribault's drinking water supply would have exceeded the MDH's strictly health-based groundwater standards for private wells. This indicates that while contaminant levels in the water supply may have exceeded the applicable regulatory criteria at times, they were always below standards that are based solely on protection of human health.

III. Conclusions

The groundwater underneath and downgradient from the site is contaminated as a result of disposal activities and subsequent leaching of contaminants. TCE has been detected in all three aquifers (glacial drift, St. Peter, and Prairie du Chien) that are monitored at the site. There appears to be no direct human exposure pathways related to the residual contamination in soil and groundwater at the site (with the possible exception of the city of Faribault's water supply system), and air emissions from the groundwater treatment system are well below applicable emission rates. Because of this, the site represents no apparent public health hazard at this time.

All scheduled remedial activities have been completed on the site, except for ongoing operation and maintenance activities which will continue into the indefinite future. These involve pumping and treating groundwater from wells PW17 and PW18, and the biannual sampling of nine monitoring wells, the catch basin, and the outfall area at the discharge to Crocker's Creek. The levels of TCE in groundwater currently are consistently below the clean-up standard of 50 $\mu\text{g/L}$ and the MDH HRL of 30 $\mu\text{g/L}$ (with the exception of well B4), but remain above the MCL of 5 $\mu\text{g/L}$. However, the MCL of 5 $\mu\text{g/L}$ may not be attainable with the current treatment system.

The ongoing low level TCE contamination of the Faribault municipal water supply does represent a completed human exposure pathway, regardless of the specific source of the TCE. Exposure to low levels of TCE can occur through ingestion, inhalation of volatilized contaminants released from, and dermal contact with TCE contaminated groundwater from the municipal water supply or from any nearby unknown private wells completed in the contaminated aquifer. Contaminant levels in the water distribution system are currently below applicable regulatory and health-based criteria, however, and do not currently represent a public health hazard. The contamination in the city's public water supply will be evaluated in a future public health assessment to be prepared by MDH.

IV. Recommendations

1. Periodic monitoring of groundwater should continue to ensure that the contaminant plume does not expand in an unexpected manner and that no future exposure occurs. At least one round of samples should be analyzed for the full range of VOCs, including vinyl chloride, to determine if other VOCs or breakdown products of TCE are present in the groundwater.
2. No new water supply wells should be installed in drift or Prairie du Chien aquifers in the area of the site. This will help ensure that no new exposure pathways are created in the future.
3. Pertinent information should continue to be distributed to residents of the surrounding area regarding site activities. It is important that the citizens be informed of potential risks in their community so they may take appropriate actions to avoid creating complete exposure pathways in the future.

V. Public Health Action Plan

The MDH's Public Health Action Plan for the site will consist of reviewing monitoring data, participating in public outreach activities regarding the site, and working with the City of Faribault to facilitate the completion of a wellhead protection plan. MDH is also in the process of preparing a broader public health assessment on the contamination in the Faribault municipal water supply system.

VI. References

ATSDR 1997. Toxicological Profile for Trichloroethylene. Agency for Toxic Substances and Disease Registry, Atlanta, GA. September 1997.

Barr 1996. Revised Monitoring Plan, Prairie Avenue Leasing Company (formerly Nutting Truck and Caster Company), Barr Engineering Company, December 1996.

Barr 2000. 1999 Annual Response Order by Consent Report, Prairie Avenue Leasing Company. Barr Engineering Company, February 21, 2000.

MDH 1995. Site Review and Update, Nutting Truck and Caster Company. Minnesota Department of Health, October 24, 1995.

MPCA 1998. Five Year Review Report, Nutting Truck and Caster Company Site. Minnesota Pollution Control Agency, March 31, 1998.

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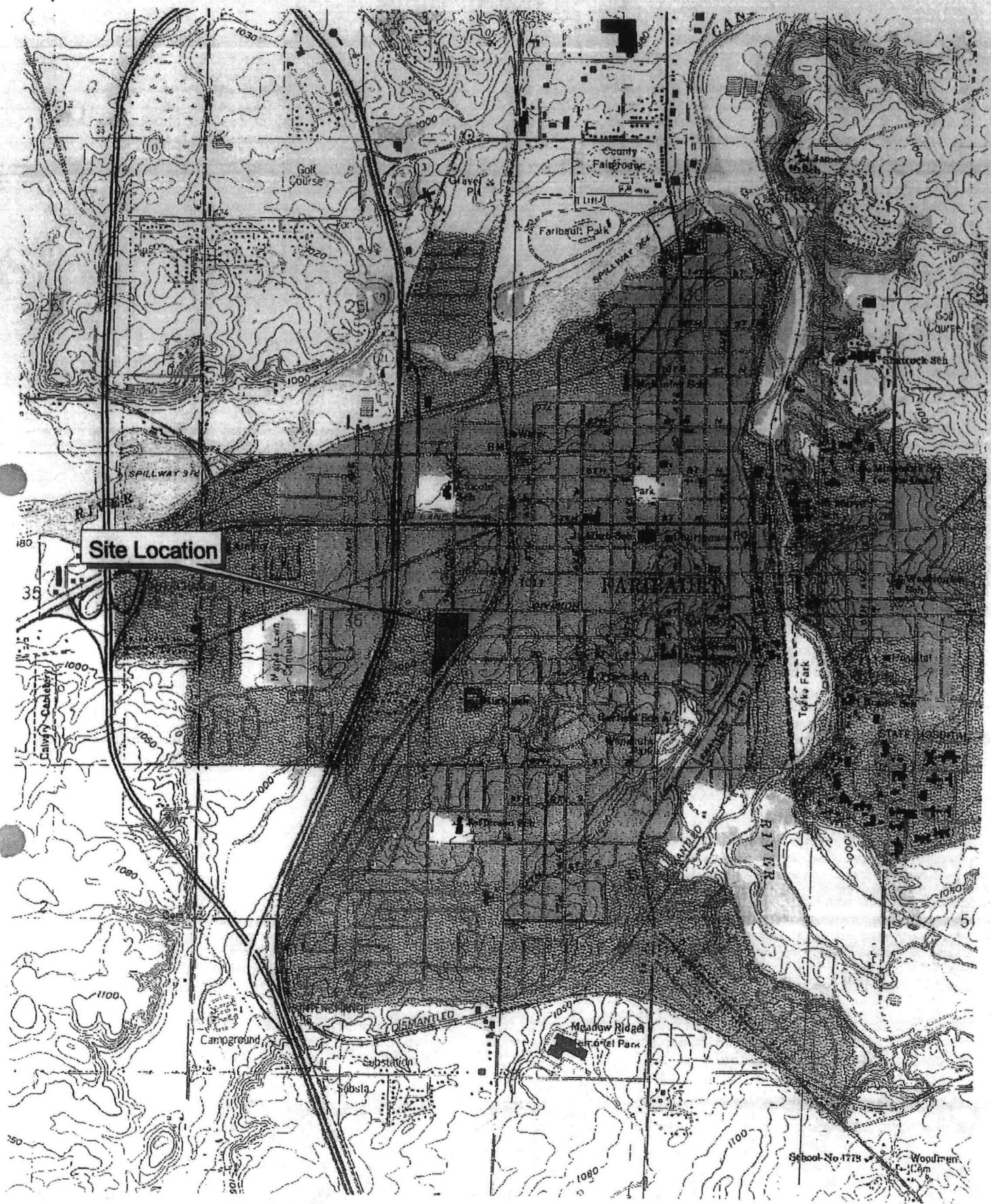
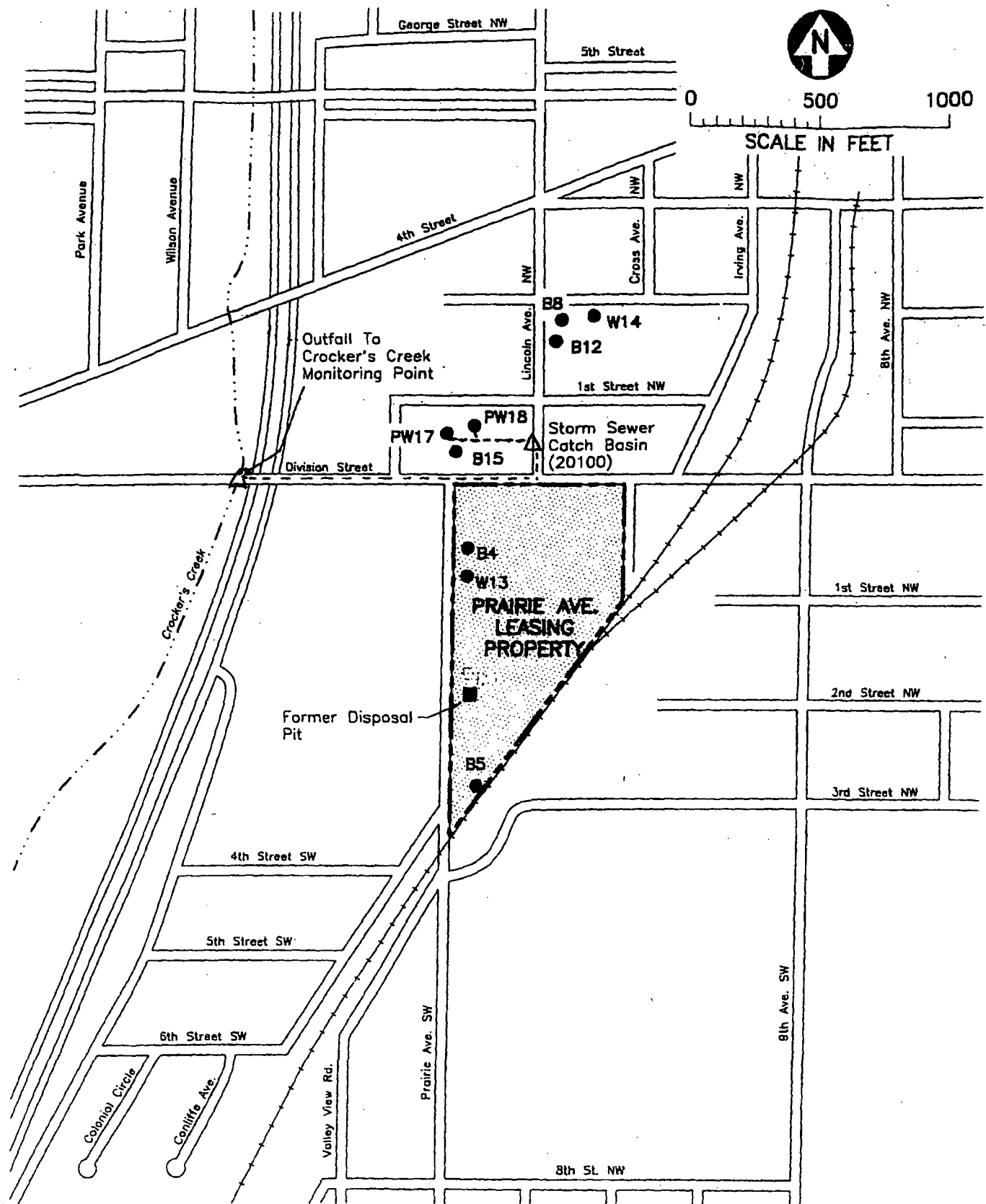


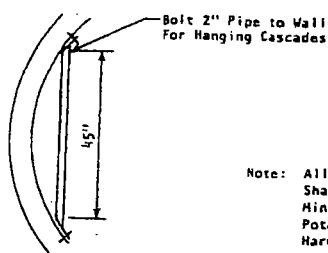
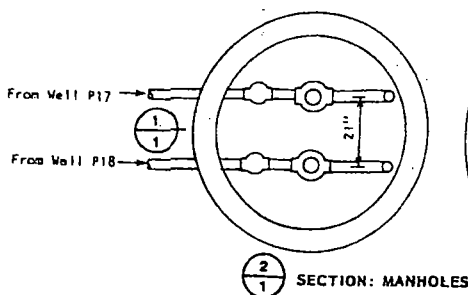
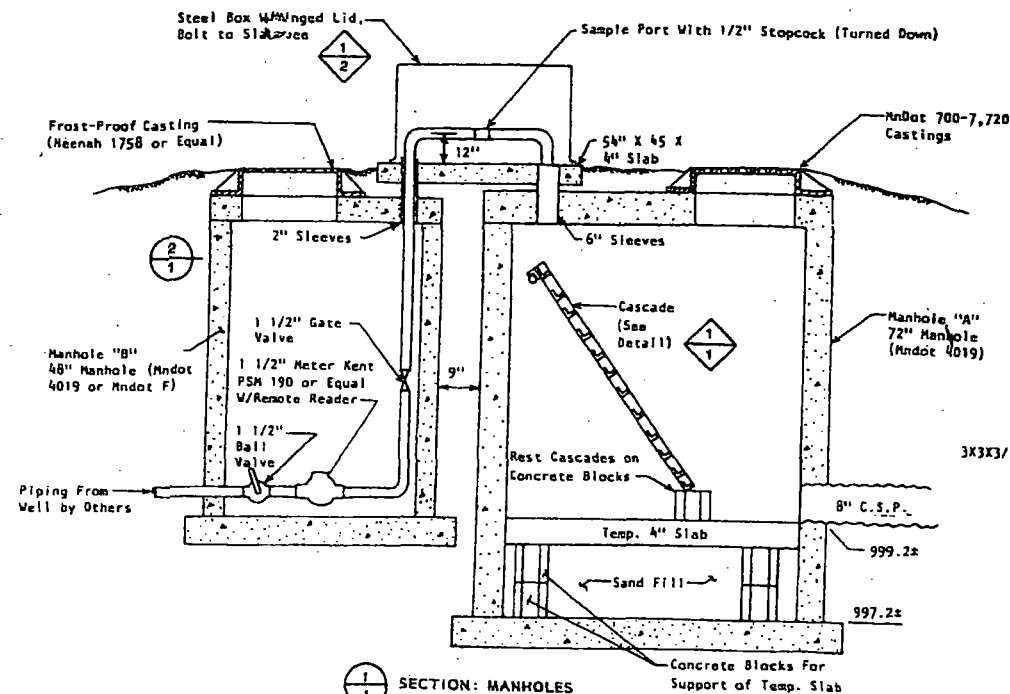
Figure 1: Nutting Site Location

Faribault, MN

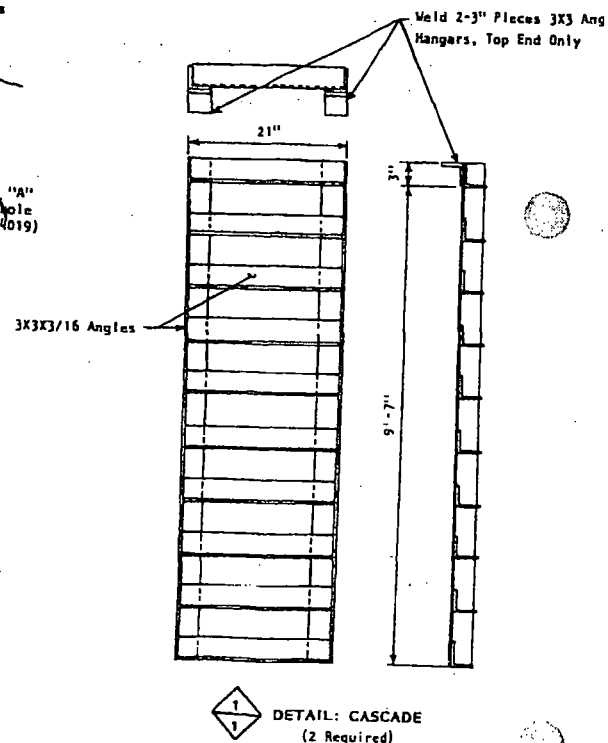


- Site Monitoring or Pump-out Well
- △ Site Surface Water Location

Figure 2: Site Map



Note: All Meters, Valves and other Plumbing Shall Meet the Requirements of the Minnesota Department of Health for Potable Water Systems. Pipe Shall Be Hard Copper.



DISCHARGE MANHOLES AND PIPING
GROUNDWATER PUMPOUT SYSTEM
THE NUTTING COMPANY

Figure 3: Groundwater
Treatment System

Figure 4: TCE Levels in Groundwater Pumpout Wells over Time

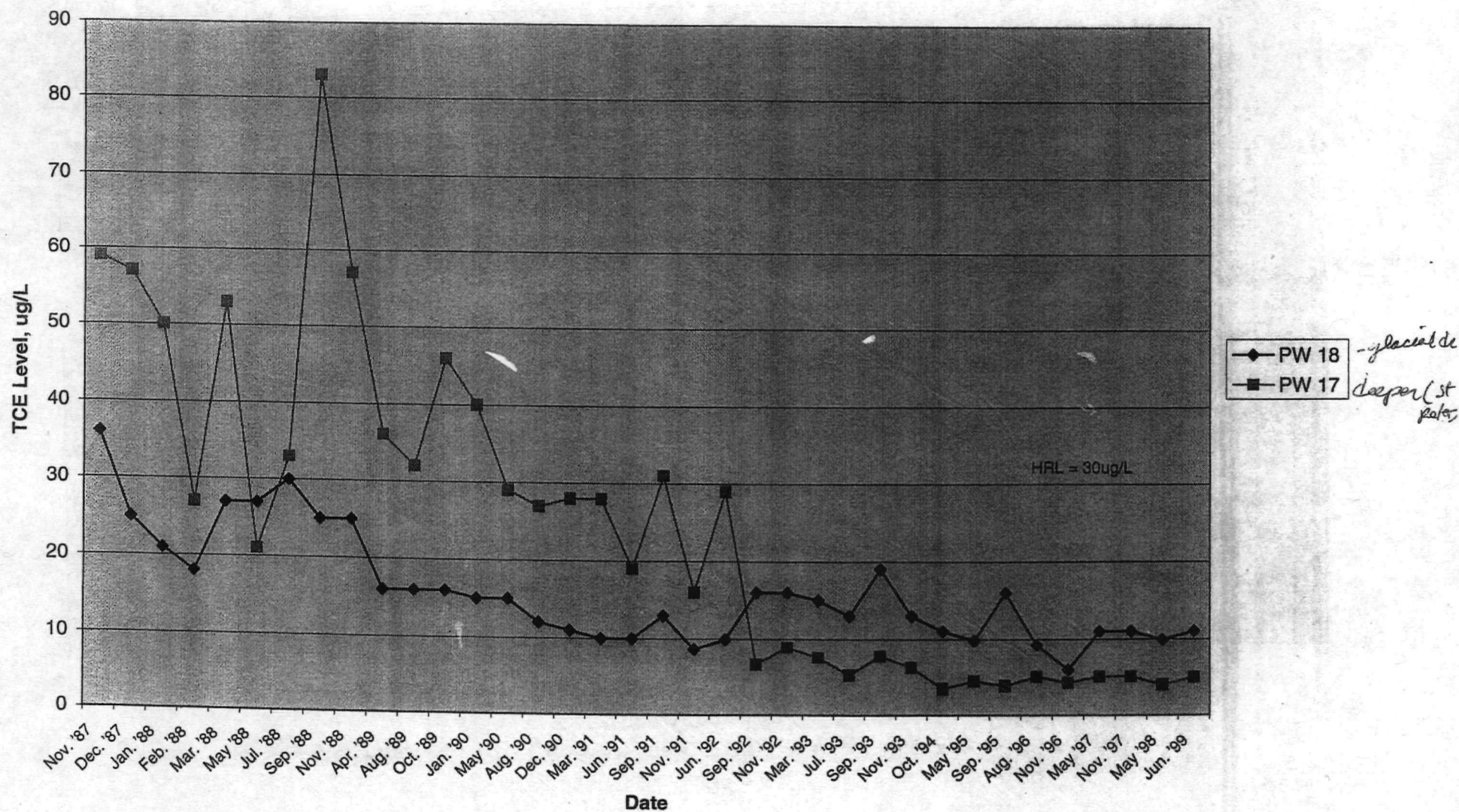


Figure 5: TCE Concentration, Faribault Water Supply
1989-1999

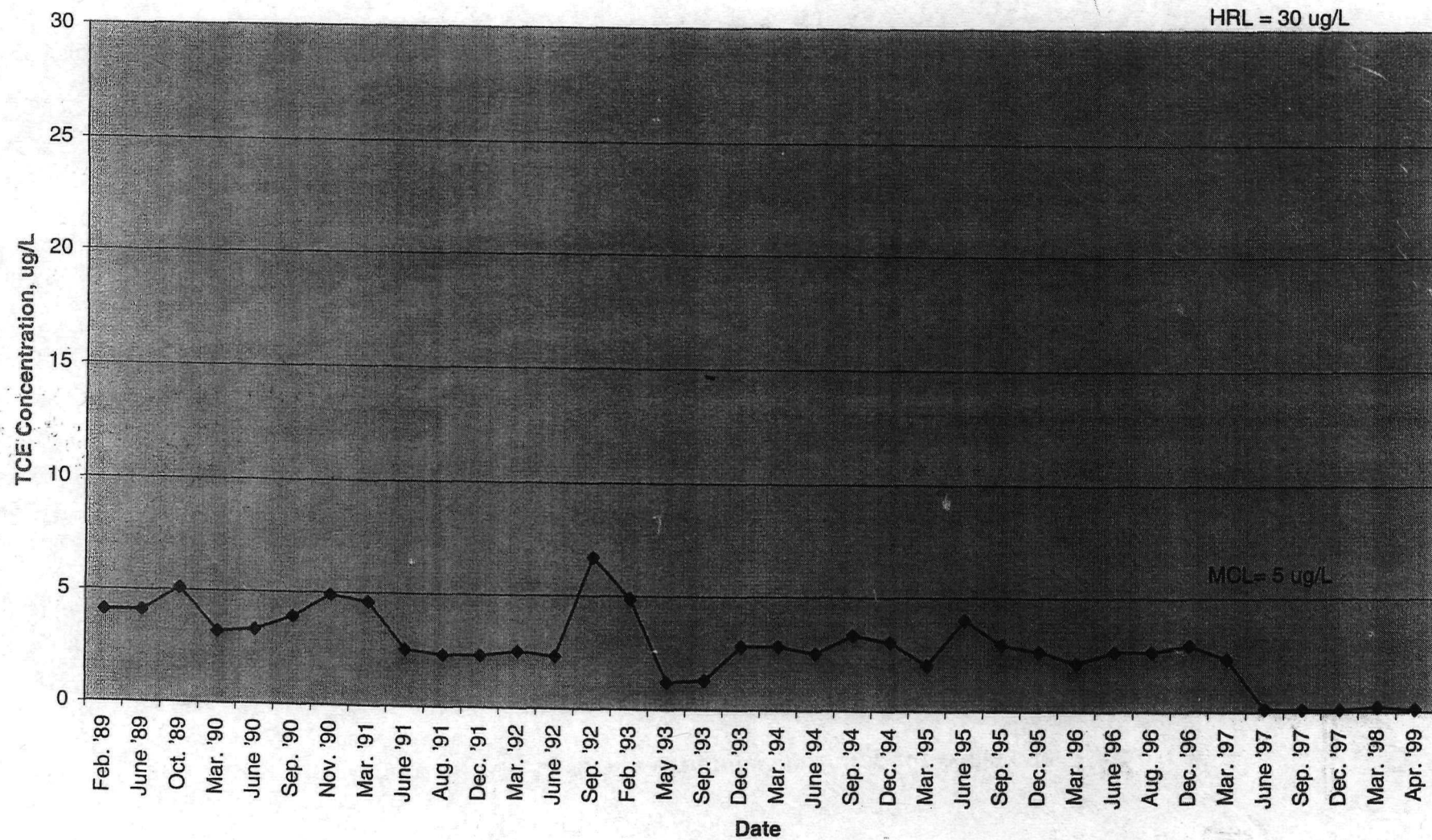


Table 1**Historical Groundwater Monitoring Well TCE Results**

source: Barr 2000

ug/L

B4		B5		B8		B12		B15		W13		W14	
Date	TCE	Date	TCE	Date	TCE	Date	TCE	Date	TCE	Date	TCE	Date	TCE
8/25/82	580	6/11/92	12	5/15/89	<0.5	5/15/89	<0.5	11/25/87	82	6/2/86	32	5/15/89	<0.5
3/29/83	450	5/12/94	17	10/23/89	<0.5	10/23/89	<0.5	12/11/87	80	6/25/86	1.7	10/23/89	<0.5
6/29/83	440	8/2/96	4.9	5/8/90	<0.5	5/8/90	<0.5	2/4/88	28	7/18/86	1.2	5/8/90	<0.5
9/27/83	450	5/19/98	9.1	12/11/90	<0.5	12/11/90	<0.5	9/1/88	14	11/27/86	4.4	12/11/90	<0.5
10/3/84	250	6/2/99	1.7	6/18/91	<0.1	6/18/91	0.2	4/7/89	6.7	5/15/89	9.1	6/18/91	<0.5
10/18/84	570			11/21/91	<0.5	11/21/91	<0.5	5/15/89	8.3	10/23/89	9.6	11/21/91	<0.5
7/18/85	410			6/11/92	<0.5	6/11/92	<0.5	8/16/89	3.7	1/2/90	8.7	6/11/92	<0.5
1/27/86	350			7/14/93	<0.5	7/14/93	<0.5	10/23/89	6.8	5/8/90	33	7/14/93	<0.5
6/25/86	330			5/12/94	<0.5	5/12/94	<0.5	1/2/90	5.5	12/11/90	9.4	5/12/94	<0.5
11/27/86	95			5/24/95	0.8	5/24/95	<0.5	5/8/90	5.5	3/11/91	14	5/24/95	<0.5
5/15/89	140			8/2/96	<0.5	8/2/96	<0.5	8/20/90	6.7	6/18/91	9.2	8/2/96	<0.5
10/23/89	47			5/30/97	<0.5	5/30/97	<0.5	12/11/90	5.5	3/18/92	7.1	5/30/97	<0.5
5/8/90	26			5/19/98	<0.5	5/19/98	<0.5	3/11/91	4.8	6/11/92	<0.5	5/19/98	<0.5
12/11/90	73			6/2/99	<0.5	6/2/99	<0.5	6/18/91	5.3	11/24/92	22	6/2/99	<0.5
6/18/91	48							9/10/91	4.4	7/14/93	31		
11/21/91	62							11/21/91	2.9	11/11/93	9.5		
6/11/92	44							6/11/92	4.1	5/12/94	15		
11/24/92	37							11/24/92	5.3	10/25/94	15		
7/14/93	28							7/14/93	4	5/24/95	10		
11/11/93	20							11/11/93	12	9/25/95	16		
5/12/94	31							5/12/94	7.6	8/2/96	9.9		
10/25/94	49							10/25/94	5.9	11/20/96	5.7		
5/24/95	84							5/24/95	4.1	5/30/97	16		
9/25/95	77							9/25/95	3.6	5/19/98	11		
8/2/96	100							8/2/96	2.2	6/2/99	22		
11/20/96	68							11/20/96	2.4				
5/30/97	73							5/30/97	2.7				
11/26/97	82							11/26/97	2.6				
5/19/98	47							5/19/98	2.3				
6/2/99	350							6/2/99	8.3				

**Table 2: MPCA Air Stripper Evaluation Form
Nutting Site Pump Out Wells**

Site Name: Nutting Site PW17		Form Completed By: Jim Kelly - MDH
365 days per year operation		
35,600,000 gallons per year max flow rate		Date Form Completed: 4/13/00

	A	B	C	D	E	
Contaminant (CAS#)	Ground water concentration (ug/liter)	Stripper influent flow rate (liters/sec)	Removal Factor	Emission Rate (ug/sec)	Significant Emission Rate (ug/sec)	Is ER ≥ SER?
	GC	IFR	RF	ER	SER	(YES/NO)
benzene (71-43-2)					4,600	
chloroform (67-66-3)					1,600	
dichlorodifluoromethane (74-71-8)					767,200	
1,1-dichloroethane (75-34-3)					1,918,000	
1,2-dichloroethane (107-06-2)					1,500	
1,1-dichloroethylene (75-35-4)	0.7	4.3	1.0	3	800	No
1,2-dichloroethylene (540-59-0)	1.6	4.3	1.0	7	2,083,900	No
dichlorofluoromethane (75-43-4)					105,300	
ethylbenzene (100-41-4)					497,700	
methylene chloride (75-09-2)					80,600	
1,1,2,2-tetrachloroethane (79-34-5)					700	
tetrachloroethylene (127-18-4)					65,200	
1,1,1-trichloroethane (71-55-6)					3,835,800	
1,1,2-trichloroethane (79-00-5)					2400	
trichloroethylene (79-01-6)	83	4.3	1.0	357	22600	No
trichlorofluoromethane (75-69-4)					2,685,100	
1,1,2 trichlorotrifluoroethane (76-13-1)					20,048,000	
toluene (108-88-3)					429,800	
vinyl chloride (75-01-4)					9,200	
xylene [mixed] (1330-20-7)					497,700	

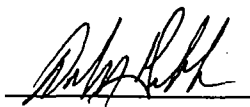
Table 2, cont'd: MPCA Air Stripper Evaluation Form
Nutting Site Pump Out Wells

Site Name: Nutting Site PW18		Form Completed By: Jim Kelly - MDH
365 days per year operation		
24,200,000 gallons per year max flow rate		Date Form Completed: 4/13/00

	A	B	C	D	E	
Contaminant (CAS#)	Ground water concentration (ug/liter)	Stripper influent flow rate (liters/sec)	Removal Factor	Emission Rate (ug/sec)	Significant Emission Rate (ug/sec)	Is ER ≥ SER?
	GC	IFR	RF	ER	SER	(YES/NO)
benzene (71-43-2)					4,600	
chloroform (67-66-3)					1,600	
dichlorodifluoromethane (74-71-8)					767,200	
1,1-dichloroethane (75-34-3)					1,918,000	
1,2-dichloroethane (107-06-2)					1,500	
1,1-dichloroethylene (75-35-4)	0.9	2.9	1.0	2.6	800	No
1,2-dichloroethylene (540-59-0)	1.5	2.9	1.0	4.4	2,083,900	No
dichlorofluoromethane (75-43-4)					105,300	
ethylbenzene (100-41-4)					497,700	
methylenne chloride (75-09-2)					80,600	
1,1,2,2-tetrachloroethane (79-34-5)					700	
tetrachloroethylene (127-18-4)					65,200	
1,1,1-trichloroethane (71-55-6)					3,835,800	
1,1,2-trichloroethane (79-00-5)					2400	
trichloroethylene (79-01-6)	36	2.9	1.0	105	22600	No
trichlorofluoromethane (75-69-4)					2,685,100	
1,1,2 trichlorotrifluoroethane (76-13-1)					20,048,000	
toluene (108-88-3)					429,800	
vinyl chloride (75-01-4)					9,200	
xylene [mixed] (1330-20-7)					497,700	

CERTIFICATION

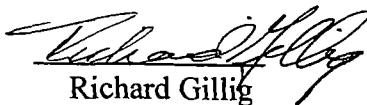
This Nutting Truck and Caster Company Site Health Consultation was prepared by the Minnesota Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.



Debra Gable

Technical Project Officer, SPS, SSAB, DHAC
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.



Richard Gillig

Chief, State Program Section, DHAC, ATSDR